OPERATING PRACTICES AND PROCEDURES FOR REDUCED VERTICAL SEPARATION MINIMUM (RVSM) – U.S. Domestic RVSM

A. Introduction.

This document is a combination of general operating practices and procedures for Reduced Vertical Separation Minimum (RVSM) operation and specific procedures for RVSM operations in the Domestic U.S., Alaska, Off Shore airspace and the San Juan Flight Information Region (FIR).

The source of reference for general practices and procedures is the Federal Aviation Administration (FAA) Advisory Circular, AC 91-85, *Authorization of Aircraft and Operators for Flight in RVSM Airspace.* The reference for specific procedures for the Domestic U.S., Alaska, Offshore airspace and the San Juan FIR is the U.S. Aeronautical Information Manual, Chapter 4, Section 6, *Operational Policy/Procedures for RVSM in the Domestic U.S., Alaska, Offshore airspace and the San Juan FIR.*

Operators should take into account their area of planned operations and reference the sources accordingly.

Note: New technologies may eliminate the need for certain crew actions. If this is the case, then adapt the guidance as necessary.

Note: This guidance is written for use by a wide variety of operator types (e.g., 14 CFR part 91, 91K, 121, 125, 129, 135 operators) and therefore, certain items are included for purposes of clarity and completeness.

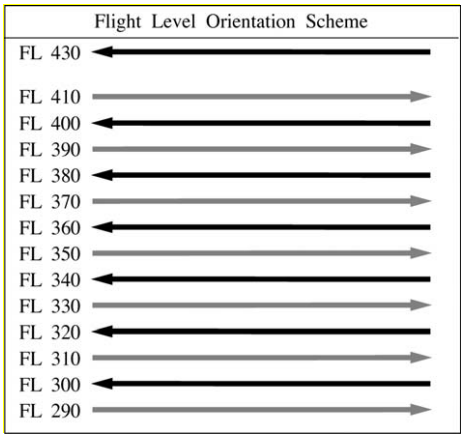
B. RVSM Description.

RVSM airspace was designed to allow 1000' vertical separation between aircraft operating at Flight Levels (FL) at or above 290. At 0901 UTC on January 20, 2005, the FAA implemented RVSM between flight level (FL) 290−410 (inclusive) in the following airspace: the airspace of the lower 48 states of the United States, Alaska, Atlantic and Gulf of Mexico High Offshore Airspace and the San Juan FIR. On the same time and date, RVSM was also introduced into the adjoining airspace of Canada and Mexico to provide a seamless environment for aircraft traversing those borders. In addition, RVSM was implemented on the same date in the Caribbean and South American regions.

In Domestic U.S., Alaska, Offshore airspace and the San Juan FIR RVSM airspace altitude assignments for direction of flight follow a scheme of odd altitude assignment for magnetic courses 000−179 degrees and even altitudes for magnetic courses 180−359 degrees for flights up to and including FL 410, as indicated in AIM FIG 4−6−1 below.

AIM FIG 4−6−1

Flight Level Orientation Scheme



NOTE−

Odd Flight Levels: Magnetic Course 000−179 Degrees

Even Flight Levels: Magnetic Course 180−359 Degrees

C. Flight Planning.

During flight planning, the flightcrew and dispatchers, if applicable, should pay particular attention to conditions which may affect operation in Reduced Vertical Separation Minimum (RVSM) airspace. These include, but may not be limited to:

1. Verifying the aircraft is approved for RVSM operations. (FAA AC 91-85)
2. Annotating the flight plan to be filed with the Air Traffic Service Provider to show the aircraft and operator are authorized for RVSM operations. Block 10 (equipment) of the International Civil Aviation Organization (ICAO) flight plan (FAA Form 7233-4) should be annotated with the letter W for filing in RVSM airspace. (AIM paragraph 5-1-9, Table 5-1-4)
    - For exceptions to the use of FAA form 7233-4, see chapter 5 of the latest version of the FAA Aeronautical Information Manual for the proper flight codes. (AIM paragraph 5-1-8, Table 5-1-3)
3. Reported and forecast weather conditions and on the route of flight and planned destination. Sources of observed and forecast information that can help the pilot ascertain the possibility of mountain wave activity (MWA) or severe turbulence are: Forecast Winds and Temperatures Aloft (FD), Area Forecast (FA), Graphical Turbulence Guidance (GTG), SIGMETs and PIREPs.
4. Minimum equipment requirements pertaining to height-keeping systems (FAA AC 91-85); and if required for the specific aircraft group; accounting for any aircraft operating restrictions related to RVSM airworthiness approval.
    - See the airplane flight manual, pilot operating manual, or a RVSM-specific flight manual supplement for aircraft specific restrictions. (FAA AC 91-85)
5. TCAS Equipage. TCAS equipage requirements are contained in 14 CFR Sections 121.356, 125.224, 129.18 and 135.189. Part 91 Appendix G does not contain TCAS equipage requirements specific to RVSM, however, Appendix G does require that aircraft equipped with TCAS II and flown in RVSM airspace be modified to incorporate TCAS II Version 7.0 or a later version.

D. Flight Plan Filing for a Non-RVSM Aircraft.

An aircraft or operator not authorized for RVSM operations or an operator/aircraft without operable RVSM equipment is referred to as Non-RVSM. The operator or dispatcher will not file the RVSM equipment code in the flight plan for Non-RVSM flights.

Note: Non-RVSM aircraft are accommodated in RVSM airspace for only a few specific reasons. See paragraph K below for accommodation of Non-RVSM aircraft and paragraph L for Non-RVSM Climb and Descent through RVSM airspace.

E. Preflight Procedures.

Accomplish the following actions during preflight:

1. Review maintenance logs and forms to ascertain the condition of equipment required for flight in the RVSM airspace. Ensure maintenance action has been taken to correct defects to required equipment.
2. During the external inspection of aircraft, pay particular attention to the condition of static sources and the condition of the fuselage skin near each static source and any other component affecting altimetry system accuracy.
    - A qualified and authorized person other than the pilot, e.g., a Flight Engineer (FE) or maintenance personnel may perform this check.
    - A chart of the RVSM critical region can normally be found in the airplane flight manual, pilot operating manual, or a RVSM-specific flight manual supplement.

3. Before takeoff:

   - The aircraft altimeters should be set to the local altimeter atmospheric pressure at nautical height (QNH) setting and should display a known elevation (e.g., field elevation) within the limits specified in aircraft operating manuals. The difference between the known elevation and the elevation displayed on the altimeters should not exceed 75 ft.
   - The two primary altimeters should also agree within limits specified by the aircraft operating manual/airplane flight manual, as applicable. An alternative procedure using atmospheric pressure at field elevation (QFE) may also be used.

   Note: Both checks should be an emphasis item for training materials.

4. Before takeoff, equipment required for flight in RVSM airspace should be operational, and indications of malfunction should be resolved.

F. Procedures before RVSM Airspace Entry.

If any of the required equipment fails prior to the aircraft entering RVSM airspace, the pilot should request a new clearance so as to avoid flight in this airspace. The following equipment should be operating normally at entry into RVSM airspace:

1. Two primary altitude measurement systems.
2. One automatic altitude-control system.
3. One altitude-alerting device.

   Note: The operator should ascertain the requirement for an operational transponder in each RVSM area where operations are intended. (See 14 CFR 91.215)

G. In-Flight Procedures.

Incorporate the following policies into flightcrew training and procedures:

1. Flightcrews should comply with aircraft operating restrictions (if required for the specific aircraft group) related to RVSM airworthiness approval.

   - See the airplane flight manual, pilot operating manual, or a RVSM-specific flight manual supplement (FAA AC 91-85).

2. Place emphasis on promptly setting the sub-scale on all primary and standby altimeters to 29.92 in. Hg/1013.2 (hPa) when climbing through the transition altitude and rechecking for proper altimeter setting when reaching the initial cleared flight level (CFL).
3. In level cruise, it is essential the aircraft is flown at the CFL. This requires particular care is taken to ensure air traffic control (ATC) clearances are fully understood and followed. Except in contingency or emergency situations, the aircraft should not intentionally depart from CFL without a positive clearance from ATC.
4. During cleared transition between flight levels, the aircraft should not be allowed to overshoot or undershoot the cleared flight level by more than 150 ft (45 m):

   - It is recommended the level off be accomplished using the altitude capture feature of the automatic altitude-control system, if installed.

5. An automatic altitude-control system should be operative and engaged during level cruise, except when circumstances such as the need to retrim the aircraft or turbulence require disengagement. In any event, adherence to cruise altitude should be done by reference to one of the two primary altimeters.
6. The altitude-alerting system should be operational.

7. At cruise flight level the two primary altimeters should agree within 200 ft (60 m) or a lesser value if specified in the aircraft operating manual/airplane flight manual. (Failure to meet this condition will require that the altimetry system be reported as defective and notified to ATC). Note the difference between the primary and stand by altimeters for use in contingency situations.
8. At intervals of approximately 1 hour, make cross-checks between the primary altimeters and the stand-by altimeter:
    - The normal pilot scan of cockpit instruments should suffice for altimeter crosschecking on most flights.
    - When operating in surveillance airspace (Radar/ADS-B), the initial altimeter cross-check should be performed after level off.
    - In oceanic and remote continental (procedural) airspace, a cross-check should be performed and recorded in the vicinity of the point where oceanic and remote continental navigation begins (e.g., on coast out). The readings of the primary and standby altimeters should be recorded and available for use in contingency situations.
    - Some aircraft have automatic comparators that compare the two primary altimetry systems. The comparators include a monitoring, warning, and fault function. The faults may be recorded automatically by the system but a record of the differences in the primary altimetry systems may not be easily derived.

    Note: In oceanic and remote continental (procedural) airspace, even if the aircraft is equipped with automatic comparators, the crew should be recording the altimeter cross-checks for use in a contingency situation.
9. Normally, the altimetry system being used to control the aircraft should be selected to provide the input to the altitude-reporting transponder transmitting information to ATC.
10. If ATC notifies the pilot of an assigned altitude deviation (AAD) error equal to or exceeding 300 ft (90 m) then the pilot should take action to return to cleared flight level (CFL) as quickly as possible.

H. Contingency Procedures after entering RVSM airspace.

1. The flight crew after realizing that they can no longer comply with RVSM requirements (aircraft system failure, weather, lost com, etc) shall request a new clearance from the controller/radio operator as soon as the situation allows.
2. If a new clearance is not available or the nature of the emergency requires rapid action the pilot should notify ATC of their action and contingency procedures.
3. Operators should refer to the RVSM section of the Aeronautical Information Manual (AIM), Section 4-6-9, *Contingency Actions: Weather Encounters and Aircraft System Failures that Occur After Entry into RVSM Airspace* and AIM Table 4-6-2 when experiencing abnormal or contingency procedures. Also, see AIM Table 4-6-1 RVSM pilot/controller phraseology.
4. It is also the responsibility of the crew to notify ATC when the implementation of the contingency procedures is no longer required.
5. Pilot Actions When Encountering Weather (e.g., Severe Turbulence or MWA).
    - Weather Encounters Inducing Altitude Deviations of Approximately 200 feet. When the pilot experiences weather induced altitude deviations of approximately 200 feet, the pilot will contact ATC

and state “Unable RVSM Due (state reason)” (e.g., turbulence, mountain wave). See contingency actions in paragraph 4−6−9.

- Severe Turbulence (including that associated with MWA). When pilots encounter severe turbulence, they should contact ATC and report the situation. Until the pilot reports clear of severe turbulence, the controller will apply merging target vectors to one or both passing aircraft to prevent their targets from merging: ***EXAMPLE−*** *“Yankee 123, FL 310, unable RVSM due severe turbulence.” “Yankee 123, fly heading 290; traffic twelve o’clock, 10 miles, opposite direction; eastbound MD−80 at FL 320” (or the controller may issue a vector to the MD−80 traffic to avoid Yankee 123).*
- Mountain Wave Activity (MWA). When pilots encounter MWA, they should contact ATC and report the magnitude and location of the wave activity. When a controller makes a merging targets traffic call, the pilot may request a vector to avoid flying directly over or under the traffic. In situations where the pilot is experiencing altitude deviations of 200 feet or greater, the pilot will request a vector to avoid traffic. Until the pilot reports clear of MWA, the controller will apply merging target vectors to one or both passing aircraft to prevent their targets from merging: ***EXAMPLE−*** *“Yankee 123, FL 310, unable RVSM due mountain wave.” “Yankee 123, fly heading 290; traffic twelve o’clock, 10 miles, opposite direction; eastbound MD−80 at FL 320” (or the controller may issue a vector to the MD−80 traffic to avoid Yankee 123).*
- FL Change or Re−route. To leave airspace where MWA or severe turbulence is being encountered, the pilot may request a FL change and/or re−route, if necessary.

6. Pilot Action to Mitigate Wake Turbulence Encounters.
   - Pilots should be alert for wake turbulence when operating:
     (a) In the vicinity of aircraft climbing or descending through their altitude.
     (b) Approximately 10−30 miles after passing 1,000 feet below opposite−direction traffic.
     (c) Approximately 10−30 miles behind and 1,000 feet below same−direction traffic.
   - Pilots encountering or anticipating wake turbulence in DRVSM airspace have the option of requesting a vector, FL change, or if capable, a lateral offset. ***NOTE−***
     (a) Offsets of approximately a wing span upwind generally can move the aircraft out of the immediate vicinity of another aircraft’s wake vortex.
     (b) In domestic U.S. airspace, pilots must request clearance to fly a lateral offset. Strategic lateral offsets flown in oceanic airspace do not apply.

AIM TBL 4−6−2

Contingency Actions: Weather Encounters and Aircraft System Failures that Occur After Entry into RVSM Airspace

Initial Pilot Actions in Contingency Situations
Initial pilot actions when unable to maintain flight level (FL) or unsure of aircraft altitude−keeping capability: • Notify ATC and request assistance as detailed below. • Maintain cleared flight level, to the extent possible, while evaluating the situation. • Watch for conflicting traffic both visually and by reference to TCAS, if equipped**.** • Alert nearby aircraft by illuminating exterior lights (commensurate with aircraft limitations).

Severe Turbulence and/or Mountain Wave Activity (MWA) Induced Altitude Deviations of Approximately 200 feet	
Pilot will: • When experiencing severe turbulence and/or MWA induced altitude deviations of approximately 200 feet or greater, pilot will contact ATC and state "Unable RVSM Due (state reason)" (e.g., turbulence, mountain wave) • If not issued by the controller, request vector clear of traffic at adjacent FLs • If desired, request FL change or re−route • Report location and magnitude of turbulence or MWA to ATC See AIM Paragraph 4−6−6, Guidance on Severe Turbulence and Mountain Wave Activity (MWA) for detailed guidance.	**Controller will:** • Vector aircraft to avoid merging target with traffic at adjacent flight levels, traffic permitting • Advise pilot of conflicting traffic • Issue FL change or re−route, traffic permitting • Issue PIREP to other aircraft AIM Paragraph 4−6−6 explains "traffic permitting."

Mountain Wave Activity (MWA) Encounters – General	
Pilot actions: • Contact ATC and report experiencing MWA • If so desired, pilot may request a FL change or re−route • Report location and magnitude of MWA to ATC See paragraph 4−6−6 for guidance on MWA.	**Controller actions:** • Advise pilot of conflicting traffic at adjacent FL • If pilot requests, vector aircraft to avoid merging target with traffic at adjacent RVSM flight levels, traffic permitting • Issue FL change or re−route, traffic permitting • Issue PIREP to other aircraft Paragraph 4−6−6 explains "traffic permitting."
NOTE− *MWA encounters do not necessarily result in altitude deviations on the order of 200 feet. The guidance below is intended to address less significant MWA encounters.*	

AIM TBL 4−6−2

Contingency Actions: Weather Encounters and Aircraft System Failures that Occur After Entry into RVSM Airspace (Continued)

Wake Turbulence Encounters	
Pilot should: • Contact ATC and request vector, FL change or, if capable, a lateral offset See Paragraph 4−6−7, Guidance on Wake Turbulence.	**Controller should:** • Provide 2,000 feet vertical separation or appropriate horizontal separation • Clear aircraft out of RVSM airspace unless operational situation dictates otherwise

"Unable RVSM Due Equipment" Failure of Automatic Altitude Control System, Altitude Alerter or All Primary Altimeters	
Pilot will: • Contact ATC and state "Unable RVSM Due Equipment" • Request clearance out of RVSM airspace unless operational situation dictates otherwise	**Controller will:** • Provide 2,000 feet vertical separation or appropriate horizontal separation • Clear aircraft out of RVSM airspace unless operational situation dictates otherwise

One Primary Altimeter Remains Operational	
Pilot will: • Cross check stand−by altimeter • Notify ATC of operation with single primary altimeter • If unable to confirm primary altimeter accuracy, follow actions for failure of all primary altimeters	**Controller will:** • Acknowledge operation with single primary altimeter

Transponder Failure	
Pilot will: • Contact ATC and request authority to continue to operate at cleared flight level • Comply with revised ATC clearance, if issued *NOTE−* *14 CFR Section 91.215 (ATC transponder and altitude reporting equipment and use) regulates operation with the* *transponder inoperative.*	Controller will: • Consider request to continue to operate at cleared flight level • Issue revised clearance, if necessary

I. Pilot-Controller Phraseology.

AIM TBL 4−6−1

RVSM Pilot/Controller Phraseology

Message	Phraseology
For a controller to ascertain the RVSM approval status of an aircraft:	(call sign) confirm RVSM approved
Pilot indication that flight is RVSM approved	Affirm RVSM

Message	Phraseology
Pilot report of lack of RVSM approval (Non−RVSM status). Pilot will report Non−RVSM status, as follows: a. On the initial call on any frequency in the RVSM airspace; b. In all requests for flight level changes pertaining to flight levels within the RVSM airspace; c. In all read backs to flight level clearances pertaining to flight levels within the RVSM airspace; and d. In read back of flight level clearances involving climb and descent through RVSM airspace (FL 290 − 410).	Negative RVSM, (supplementary information, e.g., "Certification flight").
Pilot report of one of the following after entry into RVSM airspace: all primary altimeters, automatic altitude control systems or altitude alerters have failed. (See AIM Paragraph 4−6−9, Contingency Actions: Weather Encounters and Aircraft System Failures that Occur After Entry into RVSM Airspace.) ***NOTE*** *− This phrase is to be used to convey both the initial indication of RVSM aircraft system failure and on initial contact on all frequencies in RVSM airspace until the problem ceases to exist or the aircraft has exited RVSM airspace.*	Unable RVSM Due Equipment
ATC denial of clearance into RVSM airspace	Unable issue clearance into RVSM airspace, maintain FL
*Pilot reporting inability to maintain cleared flight level due to weather encounter. (See AIM Paragraph 4−6−9, Contingency Actions: Weather Encounters and Aircraft System Failures that Occur After Entry into RVSM Airspace.).	*Unable RVSM due (state reason) (e.g., turbulence, mountain wave)
ATC requesting pilot to confirm that an aircraft has regained RVSM−approved status or a pilot is ready to resume RVSM	Confirm able to resume RVSM
Pilot ready to resume RVSM after aircraft system or weather contingency	Ready to resume RVSM

J. Post Flight.

In making maintenance logbook entries against malfunctions in height-keeping systems, the pilot should provide sufficient detail to enable maintenance to effectively troubleshoot and repair the system. The pilot should detail the actual defect and the crew action taken to try to isolate and rectify the fault. Note the following information when appropriate:

1. Primary and standby altimeter reading.
2. Altitude selector setting.
3. Subscale setting on altimeter.
4. Autopilot used to control the airplane and any differences when the alternate system was selected.
5. Differences in altimeter readings if alternate static ports selected.
6. Use of air data computer selector for fault diagnosis procedure.

7. Transponder selected to provide altitude information to ATC and any difference if alternate transponder or altitude source is manually selected.

K. Accommodation of Non-RVSM aircraft.

1. General Policies

- The RVSM mandate calls for only RVSM authorized aircraft/operators to fly in designated RVSM airspace with limited exceptions. The policies detailed below are intended exclusively for use by aircraft that the FAA has agreed to accommodate. They are not intended to provide other operators a means to circumvent the normal RVSM approval process.
- If either the operator or aircraft or both have not been authorized to conduct RVSM operations, the aircraft will be referred to as a "Non−RVSM" aircraft. 14 CFR Section 91.180 and Part 91 Appendix G enable the FAA to authorize a deviation to operate a Non−RVSM aircraft in RVSM airspace.
- Non−RVSM aircraft flights will be handled on a workload permitting basis. The vertical separation standard applied between aircraft not approved for RVSM and all other aircraft must be 2,000 feet.
- Required Pilot Calls. The pilot of Non−RVSM aircraft will inform the controller of the lack of RVSM approval in accordance with the direction provided in paragraph H, Pilot/Controller Phraseology. (AIM Table 4-6-1)

2. Categories of Non-RVSM Aircraft that may be accommodated.
Subject to FAA approval and clearance, the following categories of Non−RVSM aircraft may operate in domestic U.S. RVSM airspace provided they have an operational transponder:

- Department of Defense (DOD) aircraft.
- Flights conducted for aircraft certification and development purposes.
- Active air ambulance flights utilizing a "MEDEVAC" call sign.
- Aircraft climbing/descending through RVSM flight levels (without intermediate level off) to/from FLs above RVSM airspace (See policies for Non−RVSM Aircraft Requesting Climb to and Descent from Flight Levels above RVSM Airspace without Intermediate Level Off in the paragraph below.
- Foreign State (government) aircraft.

3. Methods for operators of Non−RVSM aircraft to request access to RVSM Airspace:

- LOA/MOU. Enter into a Letter of Agreement (LOA)/Memorandum of Understanding (MOU) with the RVSM facility (the Air Traffic facility that provides air traffic services in RVSM airspace). Operators must comply with LOA/MOU.
- File−and−Fly. File a flight plan to notify the FAA of their intention to request access to RVSM airspace.

Note: Priority for access to RVSM airspace will be afforded to RVSM compliant aircraft, then File-and-Fly flights.

L. Non−RVSM Aircraft Requesting Climb to and Descent from Flight Levels Above RVSM Airspace Without Intermediate Level Off

1. File−and−Fly. Operators of Non−RVSM aircraft climbing to and descending from RVSM flight levels should just file a flight plan.

2. Non−RVSM aircraft climbing to and descending from flight levels above RVSM airspace will be handled on a workload permitting basis. The vertical separation standard applied in RVSM airspace between Non−RVSM aircraft and all other aircraft must be 2,000 feet.

3. Non−RVSM aircraft climbing to/descending from RVSM airspace can only be considered for accommodation provided:

   - Aircraft is capable of a continuous climb/descent and does not need to level off at an intermediate altitude for any operational considerations; and
   - Aircraft is capable of climb/descent at the normal rate for the aircraft.

4. Required Pilot Calls. The pilot of Non−RVSM aircraft will inform the controller of the lack of RVSM approval in accordance with the direction provided in AIM Paragraph 4−6−8, AIM Table 4-6-1, Pilot/Controller Phraseology.

M. Special Emphasis Items: Flightcrew Training.

The following items should also be included in flightcrew training programs:

- Operators are responsible for knowing the RVSM procedures in the areas of intended operation. Operators starting RVSM operation in an RVSM area of operation new to them should ensure their RVSM programs incorporate RVSM policy and procedures unique to the new area of operations.
- Additional specific information on RVSM operational policy and procedures in the Domestic U.S., Alaska, Offshore Airspace and the San Juan FIR can be found in the Aeronautical Information Manual, Chapter 4, Section 6.
- Importance of crewmembers cross checking each other to ensure ATC clearances are promptly and correctly complied with.
- Use and limitations in terms of accuracy of standby altimeters in contingencies. Where applicable, the pilot should review the application of static source correction error/position correction error (SSEC/PEC) through the use of correction cards.
- Problems of visual perception of other aircraft at 1,000 ft (300 m) planned separation during night conditions, when encountering local phenomena such as northern lights, for opposite and same direction traffic, and during turns.
- Characteristics of aircraft altitude capture systems leading to the occurrence of overshoots.
- Operational procedures and operating characteristics related to Traffic Alert and Collision Avoidance System (TCAS)/Airborne Collision Avoidance System (ACAS) operation in an RVSM operation.
- Relationship between the altimetry, automatic altitude control, and transponder systems in normal and abnormal situations.
- Aircraft operating restrictions (if required for the specific aircraft group) related to RVSM airworthiness approval.

ATTACHMENT A - AC 91-85

What is an RVSM-Compliant Aircraft?

An aircraft is an "RVSM-Compliant Aircraft" when (1) the FAA has determined the aircraft design satisfies RVSM performance requirements and (2) the aircraft has been properly maintained on an on-going basis to conduct such operations. An aircraft will satisfy RVSM performance requirements if it complies with 14 CFR part 91 Appendix G, section 2. Aircraft may be produced RVSM-compliant or brought into compliance through the application of appropriate Service Bulletins (SB), Service Letters (SL), Engineering Change Orders (ECO, or Supplemental Type Certificates (STC).

- If the aircraft was manufactured RVSM compliant the date of the Airworthiness Certificate is usually the compliancy date. (For additional information see the Airplane Flight Manual (AFM, AFM Supplement and /or Type Certificate Data Sheet (TCDS).

- If the aircraft was made RVSM compliant through a Service Bulletin, Supplemental Type Certificate (STC), or Service Letter, or other appropriate methods, the RVSM compliant date will be listed in the airframe maintenance log. Include copies of the maintenance record return to service entry.

Equipment for RVSM Operations.

The minimum equipment fit should be as presented below.

- Two Independent Altitude Measurement Systems.

- One Secondary Surveillance Radar (SSR) Altitude Reporting Transponder. Any transponder meeting or exceeding the requirements of Technical Standard Order (TSO) C74( ), TSO C112( ), as applicable, in accordance with the operational regulations under which the airplane is approved.

- An Altitude Alert System. The altitude alert system should be capable of operation from either of the two required independent altitude measurement systems. The altitude alert system may be comprised of one or more line replaceable unit (LRUs), or it may be an integral part of a flight management system or flight management computer.

- An Automatic Altitude Control System. The automatic altitude control system is generally comprised of an autopilot with altitude hold mode. The automatic altitude control system should be capable of operation from either of the two required independent altitude measurement systems

RVSM Operating Restrictions.

Where an operating restriction has been adopted, the data package should contain the data and information necessary to document and establish that restriction. The airplane flight manual, pilot operating manual, or a RVSM-specific flight manual supplement must be revised/created as necessary to reflect this restriction.

ATTACHMENT B - EXCERPTS AND TABLES FROM THE FAA AERONAUTICAL INFORMATION MANUAL (AIM)

AIM TBL 5−1−4

Aircraft COM, NAV, and Approach Equipment Qualifiers

(For use with International Flight Plan Form 7233-4 – *See Aim section 5-1-9***)**

INSERT one letter as follows:

N if no COM/NAV/approach aid equipment for the route to be flown is carried, or the equipment is unserviceable,

(OR)

S if standard COM/NAV/approach aid equipment for the route to be flown is carried and serviceable (see Note 1),

(AND/OR)

INSERT one or more of the following letters to indicate the COM/NAV/approach aid equipment available and serviceable:

NOTE−

The capabilities described below comprise the following elements:

a. Presence of relevant serviceable equipment on board the aircraft.

b. Equipment and capabilities commensurate with flight crew qualifications.

c. Where applicable, authorization from the appropriate authority.

A	GBAS landing system	J6	CPDLC FANS 1/A SATCOM (MTSAT)
B	LPV (APV with SBAS)	J7	CPDLC FANS 1/A SATCOM (Iridium)
C	LORAN C	L	ILS
D	DME	M1	ATC RTF SATCOM (INMARSAT)
E1	FMC WPR ACARS	M2	ATC RTF (MTSAT)
E2	D-FIS ACARS	M3	ATC RTF (Iridium)
E3		0	VOR
F	ADF	P1-P9	Reserved for RCP
G	(GNSS) – *see Note 2*	R	PBN approved – *see Note 4*
H	HF RTF	T	TACAN
I	Inertial navigation	U	UHF RTF
J1	CPDLC ATN VDL Mode 2 – *see Note 3*	V	VHF RTF
J2	CPDLC FANS 1/A HFDL	**W**	**RVSM approved**
J3	CPDLC FANS 1/A VDL Mode 4	X	MNPS approved
J4	CPDLC FANS 1/A VDL Mode 2	Y	VHF with 8.33 kHz channel spacing capability
J5	CPDLC FANS 1/A SATCOM (INMARSAT)	Z	Other equipment carried or other capabilities - *see Note 5*

NOTE−

1. *If the letter S is used, standard equipment is considered to be VHF RTF, VOR, and ILS within U.S. domestic airspace.*

2. *If the letter G is used, the types of external GNSS augmentation, if any, are specified in Item 18 following the indicatorNAV/ and separated by a space.*

3. *See RTCA/EUROCAE Interoperability Requirements Standard For ATN Baseline 1 (ATN B1 INTEROP Standard – DO-280B/ED-110B) for data link services air traffic control clearance and information/air traffic control communications management/air traffic control microphone check.*

4. *If the letter R is used, the performance−based navigation levels that are authorized must be specified in Item 18 following the indicator PBN/. For further details, see Paragraph 5−1−9 b 8, Item 18 (c) and (d).*

5. *If the letter Z is used, specify in Item 18 the other equipment carried, preceded by COM/, DAT/, and/or NAV/, as appropriate.*

6. *Information on navigation capability is provided to ATC for clearance and routing purposes.*

AIM TBL 5−1−3

Aircraft Equipment Suffixes

(For FAA Domestic IFR Flight Plan Form 7233-1 – *See AIM chapter 5-1-8)*

	Navigation Capability	Transponder Capability	Suffix
RVSM	NO GNSS, No RNAV	Transponder with Mode C	/W
	RNAV, No GNSS	Transponder with Mode C	/Z
	GNSS	Transponder with Mode C	/L
No RVSM	No DME	No Transponder	/X
		Transponder with no Mode C	/T
		Transponder with Mode C	/U
	DME	No Transponder	/D
		Transponder with no Mode C	/B
		Transponder with Mode C	/A
	TACAN	No Transponder	/M
		Transponder with no Mode C	/N
		Transponder with Mode C	/P
	RNAV, no GNSS	No Transponder	/Y
		Transponder with no Mode C	/C
		Transponder with Mode C	/I
	GNSS	No Transponder	/V
		Transponder with no Mode C	/S
		Transponder with Mode C	/G